REMARKS

Claims 1 and 3-30 are pending. Claim 2 has been canceled. Claims 1, 12, 20, and 29 are in independent form.

In the Office Action mailed November 8, 2005, dependent claims 2-7, 9-11, 13-19, 21-28, and 30 were rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by U.S. Patent No. 6,404,482 to Shiraishi (hereinafter "Shiraishi").

However, the reasons for these rejections were not set forth in the Office action. This fails to fulfill the obligations established by 35 U.S.C. § 132(a), which requires that applicants be notified of the reasons for rejection of any claim for a patent.

Applicant therefore respectfully requests that reasons for the rejections of all claims be set forth in all correspondence related to this application.

CLAIM 1

Claim 1 was rejected under 35 U.S.C. § 102(b) as anticipated by Shiraishi.

As amended, claim 1 relates to a method that includes generating an electromagnetic radiation, linearly polarizing at least a portion of the radiation in a vicinity of a pupil plane of a projection system to form linearly polarized radiation, and exposing a substrate using the linearly polarized radiation at a high exposure angle. The portion of the radiation is linearly

polarized in a direction that is dependent upon a direction of the exposure angle of the radiation.

Shiraishi neither describes nor suggests linearly polarizing at least a portion of the radiation in the vicinity of the pupil plane in a direction that is dependent upon a direction of the exposure angle of the radiation, as recited in claim 1.

In this regard, attention is respectfully directed to the illustrations of Shiraishi's polarization control members (PCM's) in FIGS. 6 and 7. To begin with, only some of these PCM embodiments linearly polarize radiation at high exposure angles. For example, in embodiments 1-3, 1-5, 1-7, and 1-8, the peripheral transmissive portions are illustrated in both sectional view and the plain view without cross-hatching to denote that peripheral transmissive portions do not change the polarization of the light incident on the PCM. *See Shiraishi*, col. 14, line 29-31.

Moreover, the remainder of the PCM embodiments in FIGS. 6 and 7 linearly polarize light in the same direction across the entire peripheral transmissive portion. This is seen from the uniform direction of the cross-hatching across the entire peripheral transmissive portions in the other PCM embodiments, as well as the uniform direction of the transmitted light illustrated in the "Polarization after PCM" column.

It is thus clear that the direction of any linear polarization provided by Shiraishi's PCM embodiments is uniform across every entire peripheral transmissive portion. This directly contradicts the recital in claim 1 that the direction of linear polarization be dependent upon a direction of the exposure angle of the radiation. Example relationships between the direction of linear polarization and the direction of the exposure angle are illustrated in FIGS. 6-9 of the present application, which show changing and/or no polarization directions at different directions of the exposure angle.

The fact that Shiraishi's PCM embodiments provide uniform polarization directions across the entire peripheral transmissive portion is perhaps not surprising given that Shiraishi is primarily concerned with reducing coherence between light near the optical axis and light distant from the optical axis. *See, e.g., Shiraishi*, col. 4, line 37-42. Shiraishi teaches that such reductions in coherence can be achieved with uniform polarization across the entire peripheral transmissive portion and thus there is no need to polarize radiation in a direction that is dependent upon a direction of the exposure angle.

In summary, since Shiraishi neither describes nor suggests elements and/or limitations of claim 1, claim 1 is not anticipated by Shiraishi.

CLAIM 12

Claim 12 was rejected under 35 U.S.C. § 102(b) as anticipated by Shiraishi.

Claim 12 relates to a method that includes generating an electromagnetic radiation, shifting a phase of some of the radiation using an alternating phase shift mask to define a pattern, linearly polarizing at least a portion of the radiation to form linearly polarized radiation, and exposing a substrate using the linearly polarized radiation at a high exposure angle. The pattern includes first features oriented with a main axis in a first direction and second features oriented with a main axis in a second direction. The second direction is substantially perpendicular to the first direction.

The rejection of claim 12 cites col. 26, line 62 - col. 27, line 35 of Shiraishi as describing shifting a phase of some of the radiation using an alternating phase shift mask to define a pattern, as recited in claim 12. Applicant respectfully disagrees.

The cited portion of Shiraishi deals with a coherence reducing means (CCM) that is to be positioned on the pupil plane of a projection system. *See Shiraishi*, col. 5, line 25-27. As illustrated in FIG. 4 of Shiraishi, both the CCM and the pupil plane are distinct from the mask (reticle) R. See *Shiraishi*, col. 1, line 55. Coherence reducing means (CCM) is thus not a

mask, much less an alternating phase shift mask as recited in claim 12.

It is not surprising that Shiraishi fails to describe or suggest shifting a phase of some of the radiation using an alternating phase shift mask to define a pattern and linearly polarizing at least a portion of the radiation to form linearly polarized radiation since Shiraishi's main objective is to improve the patterning of isolated features such as contact hole patterns. Alternating phase shift masks are generally used with nested feature patterning, such as line and space patterns. Shiraishi thus describes deploying a phase shift at the pupil plane (like a traditional pupil filter), but not at the mask plane where alternating phase shift masks are deployed.

In summary, since Shiraishi neither describes nor suggests elements and/or limitations of claim 12, claim 12 is not anticipated by Shiraishi.

CLAIM 20

Claim 20 was rejected under 35 U.S.C. § 102(b) as anticipated by Shiraishi.

As amended, claim 20 relates to a lithography system that includes a stage to immobilize a substrate, an electromagnetic radiation source to emit a radiation, and a projection system having a polarizer in a vicinity of a pupil plane. The polarizer is to increase a proportion of radiation linearly polarized in a direction that is substantially perpendicular to

a propagation direction of the radiation, parallel to a surface of an immobilized substrate, and dependent upon a direction of the exposure angle of the radiation.

Shiraishi neither describes nor suggests a polarizer that is to increase a proportion of radiation linearly polarized in a direction that is substantially perpendicular to a propagation direction of the radiation, parallel to a surface of an immobilized substrate, and dependent upon a direction of the exposure angle of the radiation, as recited in claim 20.

As discussed above, Shiraishi's PCM embodiments linearly polarize light in the same direction across the entire peripheral transmissive portion. Such a uniform direction of polarization is independent of the direction of the exposure angle of the radiation.

In summary, since Shiraishi neither describes nor suggests a polarizer as recited in claim 20, claim 20 is not anticipated by Shiraishi.

CLAIM 29

Claim 29 was rejected under 35 U.S.C. § 102(b) as anticipated by Shiraishi.

As amended, claim 29 relates to a lithography system for forming microelectronic devices. The improvement comprises a pupil plane polarizer to polarize electromagnetic radiation that is to expose a substrate at high exposure angles but not polarize electromagnetic radiation at low exposure angles. The

electromagnetic radiation at high exposure angles is polarized in a direction that is dependent upon a direction of the high exposure angles.

Shiraishi neither describes nor suggests such a pupil plane polarizer.

As discussed above, Shiraishi's PCM embodiments linearly polarize light in the same direction across the entire peripheral transmissive portion. Such a uniform direction of polarization is independent of the direction of the exposure angle of the radiation.

In summary, since Shiraishi neither describes nor suggests a pupil plane polarizer as recited in claim 29, claim 29 is not anticipated by Shiraishi.

Applicant asks that all claims be allowed. No fees are believed due at this time. Please apply any charges or credits to Deposit Account No. 06-1050.

Respectfully submitted,

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